

## Colorwatcher, Colorimetric Array Reader



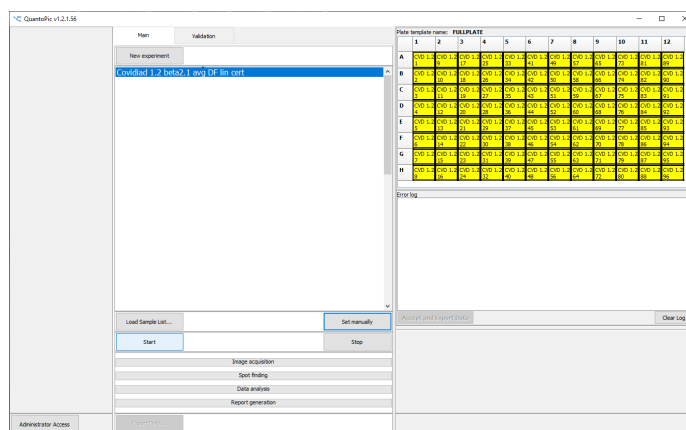
**Colorwatcher** is a compact and portable instrument designed for imaging colorimetric arrays (for example, DNA/RNA, antigen/antibody, protein biochips). The instrument by standard operates in brightfield and darkfield illumination modes with bottom and top illuminations respectively. The instrument is able to work with 96-well plate, a 12 x 8 well strip, as well as microscopic glasses (placed in a special adapter). The device is equipped with a highly sensitive CMOS camera. The instrument has an automatic mechanism of 96 well plate ejection outside the body.

The instrument can be operated by a 20V portable lithium-ion battery, which makes the device usable in the field studies or point-of-care.

The compact design allows the device to be carried in the hand luggage of the aircraft.

### Software Features:

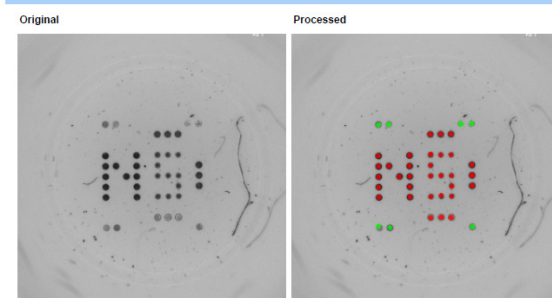
- End-User interface, with simplified interface, where user just chooses assay, loads samples and gets results
- Automated image acquisition, analysis and report generation (up to 12x12 array in 96 well plate in under 3 minutes)
- Automatic array finder via machine learning and image recognition
- Grid lay-outing (Manual and Automatic)
- Password protected Assay Developers interface with full access to the vast software parameters
- Analysis of images by the average/median intensity of the spots
- Qualitative/quantitative analysis of the arrays
- Creating Qualitative/quantitative analysis assays
- Quantitative assays with 4/5 parameter logistics functions, etc.
- Setting multi level interpretation thresholds for different type of samples in the same well (e.g. tolerance to egg and lettuce)
- Reports available in PDF, CSV, EXCEL files
- Control of camera exposure, gain, XYZ kinematics.



### Analysis Report

#### Experiment information:

Sample: A2  
 Well name: A02 D  
 Assay: Covidiad 1.2 beta2.1 avg DF lin cert  
 Template: CVD 1.2

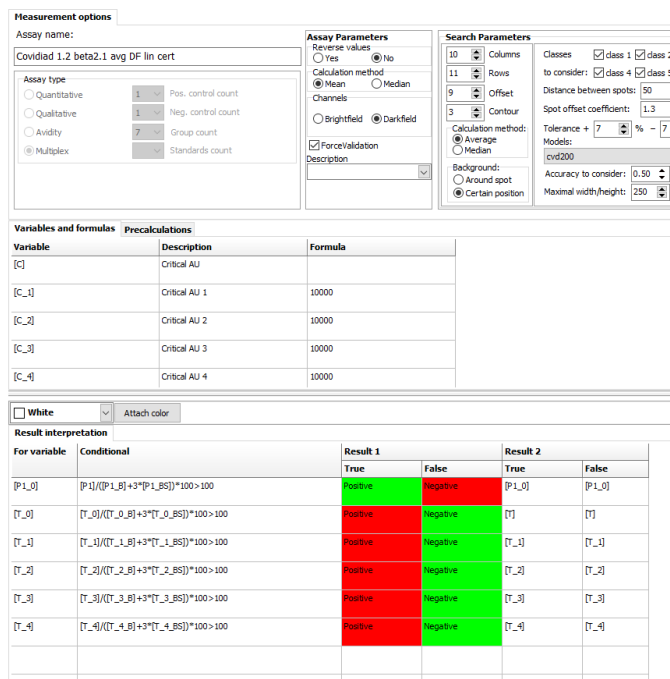


Test name	Result1	Result2
1SpikeRBD	Positive	47.4
2Spike2	Positive	77.3
3SpikeNTD	Positive	74.3
4Spike1	Positive	70.4
5Nucleocapside	Positive	83.8
Test Diagnosis		Result1
Covidiad 1.2 beta2.1 avg DF lin cert		Positive

# Colorwatcher, Colorimetric Array Reader

Specifications	
Illumination	Brightfield and darkfield (bottom and top illumination)
Arbitrary units measurement range	0 to 65535
Certified OD measurement range (for brightfield)	0.1 to 2.0 OD
Certified Diffused reflectance meas. range (for darkfield)	2 to 99
Vessels	96 well plate/12 x 8 well strip/4 microscope slides
Light source	LED
Lifetime of the light source	>10 000 hours
Data interface for unit controls / camera	USB 2.0 / USB 3.0
Camera max. resolution	3 MP, CMOS
Resolution	6 µm per pixel
Image formats	png or tiff, 16 bit
Focus	Manual, Automatic, adjustable via PC
Software	Included
PC requirements (recommended)	CPU: Intel i7, RAM: 8 GB Video card: Nvidia GTX 1050 Ti 4GB, or better (Capability only with Nvidia cards) SSD: 256 GB, OS: Windows 10 (64 bit)
Size (WxDxH)	330 × 345 × 150 mm
Weight, w/o power supply	not more than 6 kg
Power supply	Input AC 100–240 V 50/60 Hz, Output DC 20-24 V, 2.5A

## Software developers interface, Assay Editor interface and Analytes template in well



**Measurement options**  
 Assay name: Covid19 1.2 beta2.1 avg DF lin cert

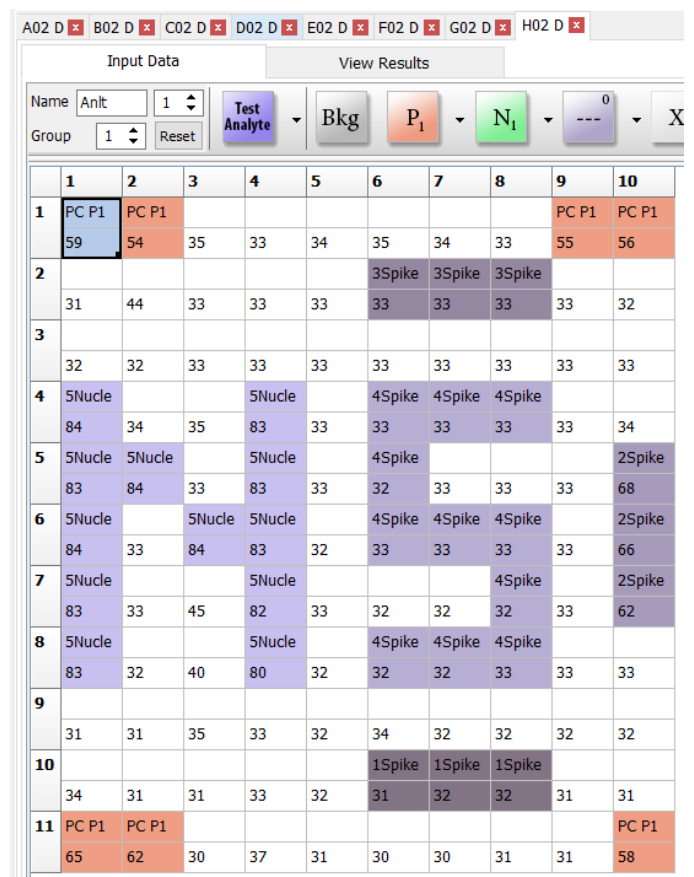
**Assay Parameters**  
 Reverse values:  Yes  No  
 Calculation method:  Mean  Median  
 Channels:  Brightfield  Darkfield  
 Force/validation  
 Description: [dropdown]

**Search Parameters**  
 Columns: 10, Rows: 11, Offset: 9, Contour: 3  
 Calculation method:  Average  Median  
 Background:  Around spot  Certain position  
 Classes:  class 1  class 2  
 to consider:  class 4  class 5  
 Distance between spots: 50  
 Spot offset coefficient: 1.3  
 Tolerance: + 7 % - 7  
 Models: cvt200  
 Accuracy to consider: 0.50  
 Maximal width/height: 250

Variable	Description	Formula
[C]	Critical AU	
[C_1]	Critical AU 1	10000
[C_2]	Critical AU 2	10000
[C_3]	Critical AU 3	10000
[C_4]	Critical AU 4	10000

**Result interpretation**

For variable	Conditional	Result 1		Result 2	
		True	False	True	False
[P1_0]	[P1]/([P1_0]+3*[P1_0BS])*100>100	Positive	Negative	[P1_0]	[P1_0]
[T_0]	[T_0]/([T_0_0]+3*[T_0_0BS])*100>100	Positive	Negative	[T]	[T]
[T_1]	[T_1]/([T_1_0]+3*[T_1_0BS])*100>100	Positive	Negative	[T_1]	[T_1]
[T_2]	[T_2]/([T_2_0]+3*[T_2_0BS])*100>100	Positive	Negative	[T_2]	[T_2]
[T_3]	[T_3]/([T_3_0]+3*[T_3_0BS])*100>100	Positive	Negative	[T_3]	[T_3]
[T_4]	[T_4]/([T_4_0]+3*[T_4_0BS])*100>100	Positive	Negative	[T_4]	[T_4]



	1	2	3	4	5	6	7	8	9	10
1	PC P1 59	PC P1 54	35	33	34	35	34	33	PC P1 55	PC P1 56
2	31	44	33	33	33	33	33	33	33	32
3	32	32	33	33	33	33	33	33	33	33
4	5Nucle 84	34	35	83	33	33	33	33	33	34
5	5Nucle 83	84	33	83	33	32	33	33	33	68
6	5Nucle 84	33	84	83	32	33	33	33	33	66
7	5Nucle 83	33	45	82	33	32	32	32	33	62
8	5Nucle 83	32	40	80	32	32	32	33	33	33
9	31	31	35	33	32	34	32	32	32	32
10	34	31	31	33	32	31	32	32	31	31
11	PC P1 65	PC P1 62	30	37	31	30	30	31	31	PC P1 58